

CLAIMS

1. Method of performing a point-to-multipoint data transmission from a transmitting station (2) to a plurality of first receiving stations (4, 6, 12, 14, 18), the method comprising the steps of:
- 5 transmitting data from the transmitting station (2) to the plurality of first receiving stations (4, 6, 12, 14, 18);
- receiving a confirmation message with respect to the data from at least one second receiving station (4) of the plurality of first receiving stations at the
- 10 transmitting station;
- transmitting the confirmation message from the transmitting station (2) to at least one third receiving station (6) of the plurality of first receiving stations.
- 15 2. The method of claim 1,
- wherein the confirmation message is at least one of a negative acknowledgement message indicating that the at least one second receiving station unsuccessfully decoded the data and a positive acknowledgement message indicating that the data was errorlessly decoded at the at least one
- 20 second receiving station.
3. The method of claim 2,
- wherein, when the confirmation message is a negative acknowledgement message, the transmitting station retransmits the data.
- 25 4. The method of claim 2,
- wherein the plurality of first receiving stations is grouped into a plurality of groups (8, 10, 16, 20) of first receiving stations such that a first group (10) includes at least one third receiving station (6) of the plurality of first receiving
- 30 stations and a second group (16) includes at least one fourth receiving station (12) of the plurality of first receiving stations;

wherein a first feedback phase is assigned to the first group and a second feedback phase is assigned to the second group in accordance with a feedback scheme;

5 wherein the at least one third receiving station (6) sends the confirmation message to the transmitting station (2) in accordance with the first feedback phase and the at least one fourth receiving station (12) sends the confirmation message in accordance with the second feedback phase.

5. The method of claim 4,
10 wherein, after the transmitting station has received and decoded the confirmation message from the at least one third receiving station of the first group, the transmitting station sends the confirmation message, which it received from the at least one third receiving station of the first group, to the at least one fourth receiving station of the second group;

15 wherein the feedback scheme is adapted such that the confirmation message of the at least one third station of the first group is decoded at the transmitting station and sent to the at least one fourth receiving station of the second group before the at least one fourth receiving station sends the confirmation message to the transmitting station.

20 6. The method of claim 5,
wherein, when the confirmation message decoded at the at least one fourth receiving station is the negative acknowledgement message, the at least one fourth receiving station of the second group does not send its own
25 negative acknowledgement message.

7. The method of claim 4,
wherein the at least one third receiving station and the at least one fourth receiving station only send the confirmation message in case the
30 decoding of the data of the at least one third receiving station and the at least one fourth receiving station is unsuccessful such that the at least one third receiving station and the at least one fourth receiving station only send the

negative acknowledgement message indicating that the data could not be decoded error-free.

8. The method of claim 4,
5 wherein, after a retransmission of the data, the transmitting station listens only to third groups of the plurality of groups which have not sent the positive acknowledgement message with respect to the data;
wherein the third groups are considered to have sent the positive acknowledgement message in case all of the receiving stations belonging to
10 the groups have sent the positive acknowledgement message.

9. The method of claim 1,
wherein the confirmation message is a negative acknowledgement message indicating that the at least one second receiving station could not
15 decode the data error-free; and
wherein the transmitting station retransmits the data upon reception and decoding of the confirmation message.

10. The method of claim 1,
20 wherein the confirmation message is a positive acknowledgement message indicating that the at least one second receiving station decoded the data error-free; and
wherein the transmitting station retransmits the data after not receiving the confirmation message from one of the plurality of first receiving stations.

- 25 11. The method according to claim 1,
wherein the method is applied in the context of Multimedia Broadcast Multicast Services in UMTS.

- 30 12. The method according to claim 4,
wherein the confirmation message comprises confirmation data in form of soft bits; and

wherein a soft-combining of the confirmation message of the at least one third receiving station of the first group with the confirmation message of the at least one fourth receiving station of the second group is performed.

- 5 13. The method according to claim 4,
 wherein a fifth receiving station of the plurality of first receiving stations determines a fourth group of the plurality of groups of first receiving stations after receiving information about the number of groups of the first receiving stations available for grouping;
10 wherein, after determination of the fourth group, the fifth receiving station considers itself to belong to the fourth group; and
 wherein the determination of the fourth group to which the fifth receiving station considers itself to belong to is performed by the fifth receiving station without additional signalling.

- 15 14. The method according to claim 13,
 wherein the determination of the fourth group to which the fifth receiving station is assigned is performed on the basis of at least one of a random number generated by the fifth receiving station, a modulo operation applied to
20 one of an IMSI and a TMSI of the fifth receiving station, and a determined path loss during the data transmission.

15. The method according to claim 1,
 wherein the confirmation message is transmitted to the transmitting
25 station from at least one sixth receiving station of the plurality of first receiving stations with a first transmission power;
 wherein, when a minimum number of sixth receiving stations transmits the confirmation message in accordance with a third feedback phase in accordance with a feedback scheme, resulting in a superposition of
30 confirmation messages and therefore in an increase of power received at the transmitting station, the received power at the transmitting station is sufficient for decoding the superposition of confirmation messages; and

wherein, when less than a minimum number of sixth receiving stations transmits the confirmation message in accordance with the third feedback phase, the received power at the transmitting station is not sufficient for decoding the superposition of confirmation messages.

5

16. The method according to claim 4,

wherein, after the at least one third receiving station has sent the confirmation message with a second transmission power to the transmitting station in accordance with the first feedback phase, it sends the confirmation
10 message in accordance with the second feedback phase and with a third transmission power; and

wherein the third transmission power is higher than the second transmission power.

15

17. The method of claim 1,

wherein the data is a data packet;

wherein the method is a retransmission protocol in a cellular radio communication system.

20

18. Data transmission system for a point-to-multipoint data transmission from a transmitting station (2) to a plurality of first receiving stations (4, 6, 12, 14, 18),

wherein the transmitting station is adapted to transmit data from the transmitting station to the plurality of first receiving stations;

25

wherein each of the plurality of first receiving stations is adapted to send a confirmation message to the transmitting station;

wherein the confirmation message relates to a decoding of the data at the respective receiving station of the plurality of first receiving stations;

wherein the transmitting station is adapted to receive a confirmation
30 message with respect to the data from at least one second receiving station of the plurality of first receiving stations; and

wherein the transmitting station is adapted to transmit the confirmation message, which it received from at least one second receiving station, to at least one third receiving station of the plurality of first receiving stations.

5 19. The data transmission system of claim 18,

 wherein the plurality of first receiving stations is grouped into a plurality of groups (8, 10, 16, 20) of first receiving stations such that a first group (10) includes at least one third receiving station (6) of the plurality of first receiving stations and a second group (16) includes at least one fourth receiving station
10 (12) of the plurality of first receiving stations;

 wherein a first feedback phase is assigned to the first group and a second feedback phase is assigned to the second group in accordance with a feedback scheme;

 wherein the at least one third receiving station sends the confirmation
15 message to the transmitting station in accordance with the first feedback phase and the at least one fourth receiving station sends the confirmation message in accordance with the second feedback phase;

 wherein, after the transmitting station has received and decoded the confirmation message from the at least one third receiving station of the first
20 group, the transmitting station sends the confirmation message, which it received from the at least one third receiving station of the first group, to the at least one fourth receiving station of the second group;

 wherein the feedback scheme is adapted such that the confirmation message of the at least one third station of the first group is decoded at the
25 transmitting station and sent to the at least one fourth receiving station of the second group before the at least one fourth receiving station sends the confirmation message to the transmitting station.

 20. The data transmission system of claim 19,

30 wherein, when the confirmation message from the at least one third receiving station of the first group is the negative acknowledgement message indicating that one or more of the at least one third receiving station

unsuccessfully decoded the data, the at least one fourth receiving station of the second group is adapted to not send the confirmation message.

21. The data transmission system of claim 19,
5 wherein the at least one third receiving station and the at least one fourth receiving station only send the confirmation message in case the decoding of the data at the at least one third receiving station and at the at least one fourth receiving station is unsuccessful such that the at least one third receiving station and the at least one fourth receiving station only send
10 the negative acknowledgement message indicating that the data could not be decoded error-free.

22. Transmitting station (2) for a data transmission system for a point-to-multipoint data transmission from the transmitting station to a plurality
15 of receiving stations (4, 6, 12, 14, 18),

wherein the transmitting station is adapted to transmit data from the transmitting station to the plurality of receiving stations;

wherein the transmitting station is adapted to receive a confirmation message with respect to the data from at least one first receiving station of the plurality of receiving stations;
20

wherein the confirmation message relates to a decoding of the data at the at least one first receiving station of the plurality of receiving stations; and

wherein the transmitting station is adapted to transmit the confirmation message, which it received from the at least one first receiving station, to at
25 least one third receiving station of the plurality of receiving stations.

23. Receiving station (6) for a data transmission system for a point-to-multipoint data transmission from a transmitting station to a plurality of receiving stations,

30 wherein the receiving station is adapted to receive data sent from the transmitting station to the plurality of receiving stations;

wherein the receiving station is adapted to send a first confirmation message to the transmitting station;

wherein the first confirmation message relates to a decoding of the data at the receiving station;

5 wherein the receiving station is adapted to receive a second confirmation message which is sent from the transmitting station;

wherein the second confirmation message relates to a decoding of the data at another receiving station of the plurality of receiving stations.